

SITE PREPARATION REQUIREMENTS AND INSTALLATION PLAN

**FOR
FAA AERONAUTICAL CENTER (FAAAC)
OPERATIONAL AND SUPPORTABILITY IMPLEMENTATION
SYSTEM (OASIS)**

**CONTRACT NO: DTFA01-97-C-00070
DOCUMENT CONTROL NUMBER 7004052
CDRL: A038-05**

30 SEPTEMBER 1998

**PREPARED FOR:
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1.0 SCOPE

This Site Preparation Requirements and Installation Plan (SPRIP) was prepared using Data Item Description (DID) OAS-IMP-002. The SPRIP defines activities and responsibilities to be performed by Harris and the Federal Aviation Administration (FAA) to ensure successful Operational and Supportability Implementation System (OASIS) equipment installation and test for the FAA Aeronautical Center (FAAAC) system. Acronyms are defined in Appendix A.

Site preparation work detailed in this document will be performed by a Harris selected local contractor prior to the Site Readiness Review (SRR). Detailed drawings are used wherever possible to depict placement or other installation criteria in a clear, accurate form.

Harris will conduct a Site Readiness Review Survey (SRRS) 20 working days prior to site installation. During the SRRS, all site preparation work completed by the local contractor will be reviewed to allow time to correct any discrepancies prior to the Harris on-site installation activities. Harris will also re-survey the OASIS equipment installation locations for items that may have been installed since the previous survey and need to be addressed prior to installation. The FAA provided interfaces and demarcation to National Airspace Data Interchange Network (NADIN II) and dial-up lines will be verified at this time.

This SPRIP includes schedules and all anticipated Site preparation, installation, and test activities that will be completed.

2.0 APPLICABLE DOCUMENTS

The following documents are applicable to the System Design, Site Preparation, and Installation activities to the extent specified herein.

FAA Documents

OAS-IMP-002	Data Item Description, Site Preparation Requirements and Installation Plan (November 6, 1997)
FAA-STD-020B	Transient Protection, Grounding, Bonding and Shielding Requirements For Equipment (May 11, 1992)

Military Specifications

MS25036	Lug, Terminal, Crimp Style, Copper (Rev. P December 8, 1996)
MS51958	Screw, Machine pan-Head, Cross-Recessed, Corrosion-Resisting Steel, UNF-2A (Rev. C November 5, 1992)

Other

NFPA-70	National Electric Code (NEC), National Fire Protection Association (NFPA) (1996)
EIA-310-D	Electronics Industry Association, Cabinets, Racks, Panels, and Associated Equipment (August 24, 1992)
No Number	International Conference of Building Officials (ICBO), Uniform Building Code (1994)

Harris Documents

2006888	Antenna Vendor Item Drawing (TBD)
7004018 (A013-01)	B Level Specification, January 22, 1998
7004035 (A037-01)	Site Survey Plan, December 22, 1997
7004034 (A036-01)	OASIS National Installation Strategy, December 9, 1997

Harris Drawings

3048144-101	OASIS Installation, FAA Aeronautical Center (FAAAC) (Pre-released)
3048145	Drawing Tree, OASIS FAAAC (Released)
3048146	Interconnection Drawing, OASIS Installation, (FAAAC) (Released)
3048147-101	Cable Marking Assembly OASIS Installation, (FAAAC) ACT (Released)

3.0 GENERAL EQUIPMENT SPECIFICATIONS

3.1 Physical Specifications

3.1.1 Weight

The weight of the OASIS Equipment Area rack equipment for the FAA Aeronautical Center (FAAAC) system is listed in Table 3.1.1. The Console equipment weight is listed in Table 3.1.1-2 for the FAAAC system.

3.1.2 Dimensions

The Equipment Area installation consists of three (3) equipment racks and five (5) workstations. The EIA-310-D standard equipment racks are shown in Figure 3.2.2-1. Each of the racks measure 73.125" height, 22.06" width, and 38.5" depth. The Equipment Area tables for the workstations measure 30" height, 72" width, and 33" depth. These table configurations are illustrated in Figure 3.2.2-2.

The Specialist Console configurations are shown in Appendix B. Harris will make no changes to the overall height, width, or depth of the Specialist Position console.

3.2 Equipment Configuration

3.2.1 System Equipment Configuration

Figure 3.2.1 System Block Diagram illustrates the FAA Aeronautical Center (FAAAC) OASIS system level block diagram of equipment which will be installed. The Installed equipment compliment is comprised of Specialist Position Consoles (Inflight, Preflight), printers, Equipment Area racks, and the satellite earth station. The satellite earth station will be used to receive both the Harris Weather Data Service (HWDS) and the UNISYS Next Generation Radar (NEXRAD) data.

3.2.1.1 Interconnecting Cables

Harris will provide and install all system interconnecting cables for the delivered configuration. The demarcation points for the site-provided interfaces are at the TELCO interface and the NADIN II interface. The system cables are categorized into 4 groups:

- a. Rack Interconnect: The rack interconnection cable group consists of cables supplied by the equipment vendors and/or built to Harris specifications. These cables are manufactured using materials of varying standards that include National Electric Code (NEC) Types CM and AWM.
- b. Local Area Network: The twisted pair Ethernet cables connecting the console workstations and the printers to the Ethernet switches are TIA/EIA-568-B Category 5, 100Ω Unshielded Twisted Pair (UTP). These cables are plenum rated NEC Type CMP.
- c. Site Interface: Site communications cables connect to the site demarcation point for the telecommunications circuits and the NADIN interfaces. These cables are plenum rated NEC Type CMP.
- d. Radio Frequency (RF): The earth station Low Noise Block (LNB) down-converter is connected using 1/4-inch foam dielectric heliax cable. This cable run is divided by the building egress lightning protection into the exterior and interior segments. The exterior segment uses a Ultra-Violet (UV) stabilized, polyethylene jacket, heliax cable between the LNB and lightning protection. After the lightning protection, and interior to the building, plenum rated NEC Type CATVP or CL-2P is used.

Table 3.1.1-1 FAAAC Equipment Area Rack Weight

Location	Equipment	Quantity	Weight Each	Weight Total
System 1 Rack	Unisys Receiver (est)	1	30	30
	EF Data Modem	1	10	10
	Net Server (est)	1	10	10
	Flight Data Server	1	43	43
	Cables (est)	1	10	10
	Brackets/Panels (est)	1	30	30
	Enclosure (est)	1	100	100
	Hardware (est)	1	7	7
	Rack 1 Total			240
Common Rack	Ethernet Switch	2	41	82
	Patch Panel (est)	1	10	10
	HP Disk Array	1	75	75
	UPS	2	235	470
	Power Controller (est)	1	20	20
	Cables (est)	1	20	20
	Brackets/Panels (est)	1	30	30
	Enclosure	1	100	100
	Hardware (est)	1	7	7
	Rack 2 Total			814
System 2 Rack	Unisys Receiver (est)	0	30	0
	EF Data Modem	0	10	0
	Net Server (est)	1	10	10
	Flight Data Server	1	43	43
	Cables (est)	1	10	10
	Brackets/Panels (est)	1	20	20
	Enclosure (est)	1	100	100
	Hardware (est)	1	7	7
	Rack 3 Total			190
Equipment weight total				1244

Table 3.1.1-2 FAAAC Console Equipment Weights

Location	Equipment	Quantity	Weight Each	Weight Total
Preflight Console	Graphic Monitors (est)	2	80	160
	Workstations (est)	1	35	35
	Keyboard (est)	1	3	3
	Jack Modules (est)	1	1	1
	Cables (est)	1	10	10
	Brackets/Shelves (est)	1	25	25
	Preflight Totals			234
Inflight	Graphic Monitors (est)	2	80	160
	Workstations (est)	1	35	35
	Keyboard (est)	1	3	3
	Jack Modules (est)	1	1	1
	Cables (est)	1	10	10
	Brackets/Shelves (est)	1	25	25
	Inflight Totals			234
Printers	Color Printer	1	105	105
	Laser Printer	1	36	36
	Printer Total			141
Summary Totals:				
Preflight Total		3	234	702
Inflight Total		2	234	468
Printers Total		1	141	141
ACT Operations Area Total				1311

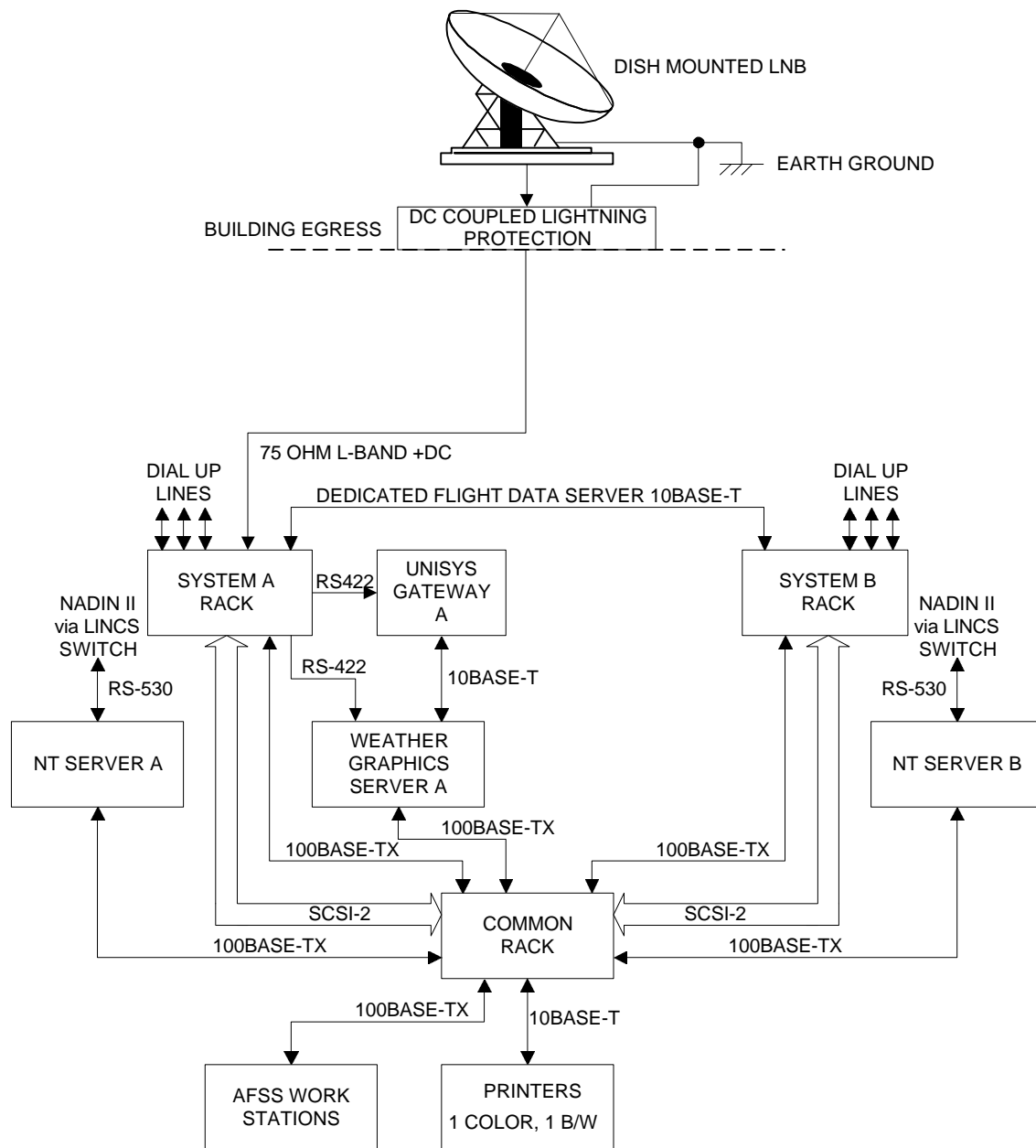


Figure 3.2.1 System Block Diagram

3.2.1.2 Cable Marking

All interconnecting cables will have cable labels designating the following information:

1. Part Number
2. Wire Number (designated by the Site interconnect drawing)
3. To: (local connection)
4. From: (distant connection)

3.2.2 Equipment Area

The rack equipment located in the Equipment Room Area is illustrated in Figure 3.2.2-1. The table mounted equipment for the Equipment Room Area is illustrated in Figure 3.2.2-2.

3.2.3 Workstation Equipment

The workstation equipment will be mounted in two configurations Preflight (3) and Inflight (2). These before-modification and after-modification configurations are illustrated in Appendix B.

3.2.3.1 Specialist Console Equipment Configuration

The Specialist Position Console (Preflight and Inflight) workstation provides the human interface to weather and flight data. Each Console workstation has two high-resolution graphics monitors mounted in the Console with one mouse and keyboard. The training interface to the workstation integral sound card is through the jack module mounted in the right side of the Console.

The Console block diagram is shown in Figure 3.2.3.1.

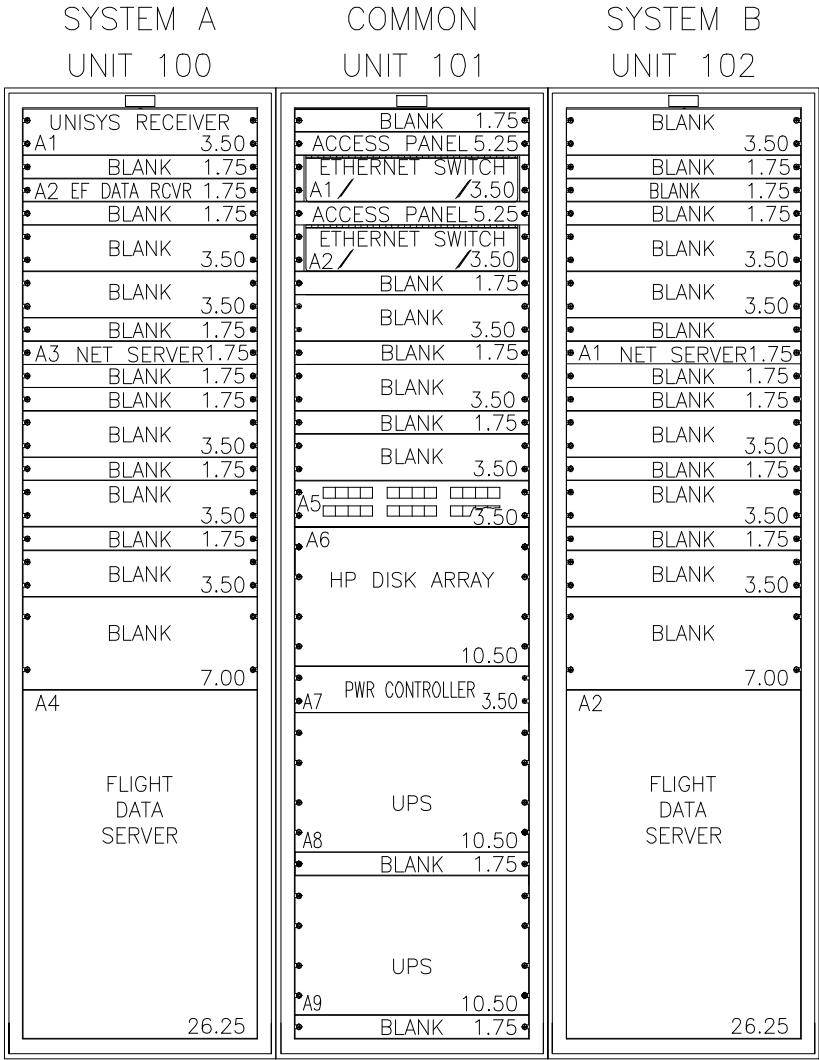


Figure 3.2.2-1 FAAAC Equipment Area Rack Configuration

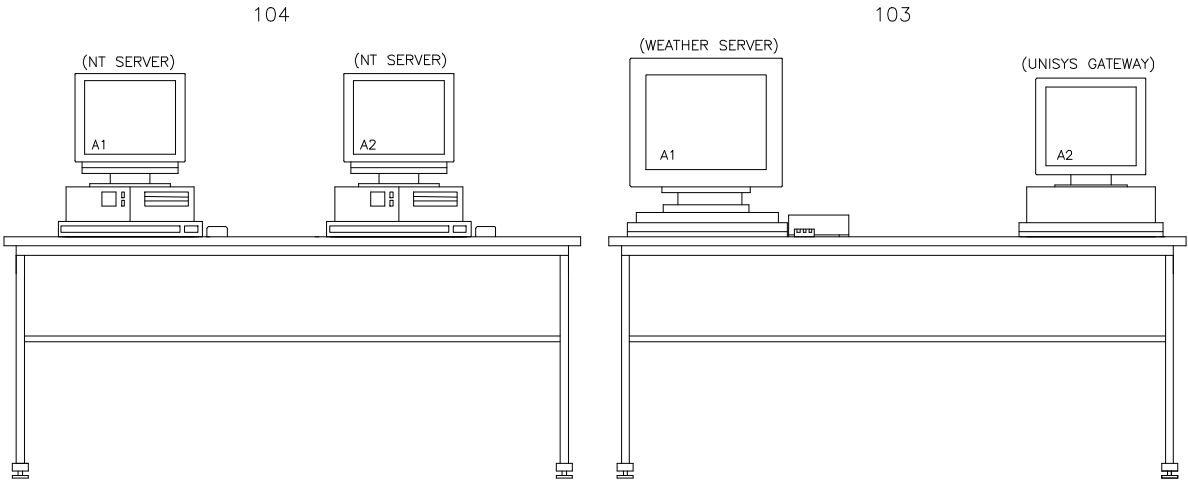


Figure 3.2.2-2 FAAAC Equipment Area Table Configuration

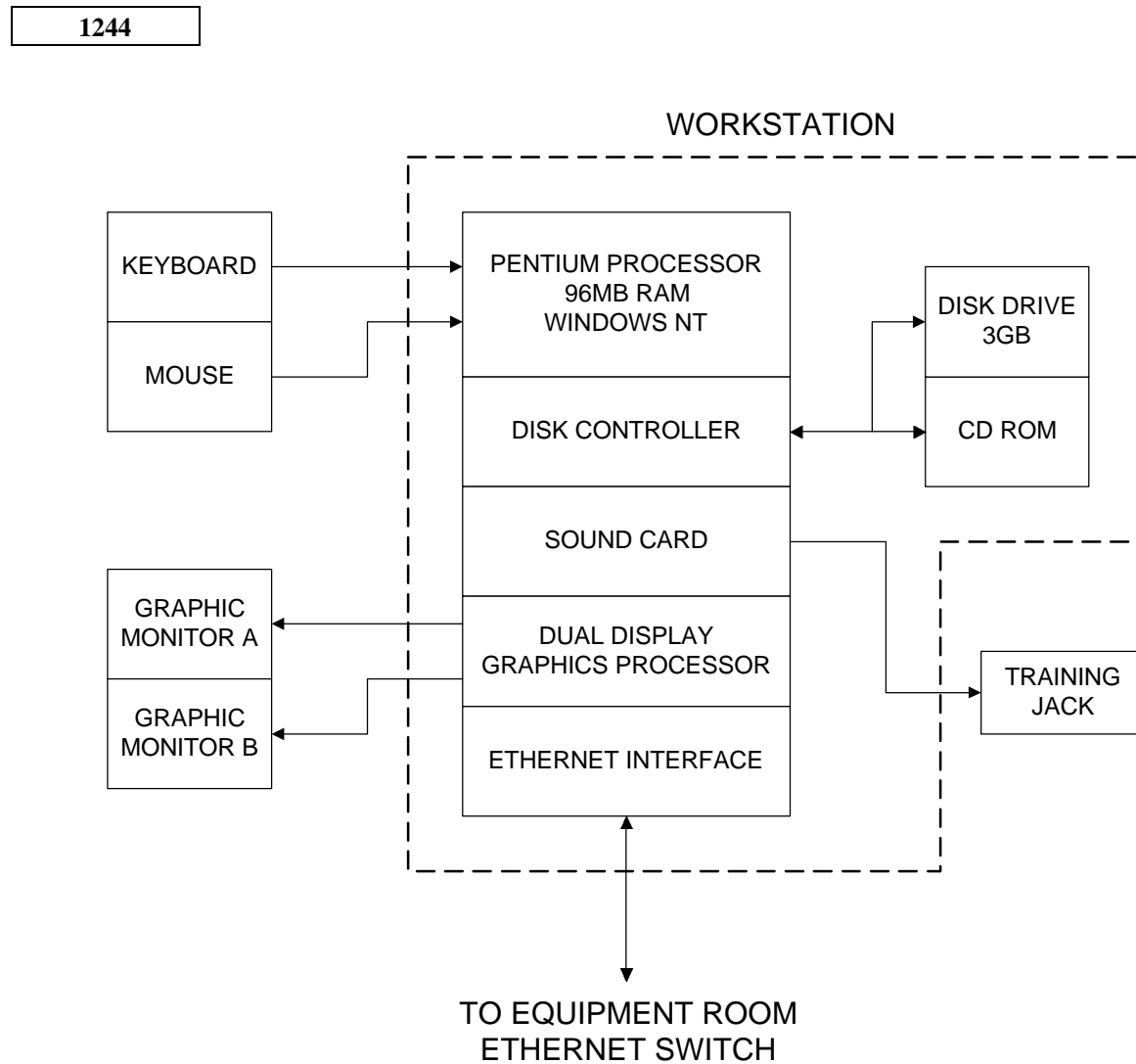


Figure 3.2.3.1 Specialist Console Workstation Inflight and Preflight Installation Requirements

3.2.4 Floor Space

3.2.4.1 Equipment Area Floor Space Requirements

The OASIS Equipment Area floor space requirement for the FAA Aeronautical Center (FAAAC) is calculated in Table 3.2.4.1

Table 3.2.4.1 FAAAC Equipment Area Floor Space Requirements

Equipment	Width	Depth	Sq. Ft.
System A Rack	22.06	38.50	5.90
System B. Rack	22.06	38.50	5.90
Common Rack	22.06	38.50	5.90
Table (NT Server)	72.00	33.00	16.50
Table (Weather Server)	72.00	33.00	16.50
Total Equipment Requirement			50.70
Service/Operator Clearance			
Racks (Front/Back)	132.36	36.00	33.09
Tables (Front)	144.00	36.00	36.00
Total Service/Operator Clearance (Each System)			69.09

3.2.4.2 Specialist Console Space Requirements

The equipment located in the Specialist Consoles requires no new floor space.

3.2.4.3 Printer Floor Space Requirements

The printer floor space is determined by the FAA provided table. Harris recommends the table measures 60" width x 30" depth. Harris will deliver 2 printers, a Hewlett-Packard LaserJet printer and a Tektronix Phaser color printer. The LaserJet unit measures 13" height, 15" width, 16" depth, and the Phaser printer measures 18" height, 30" width, 19" depth.

3.2.5 Cable Tray and Conduit

There will be no new cable trays installed during the site installation. Harris will use only existing cable trays. Cables runs from equipment cabinets to the wall egress for the satellite antenna will be run in site existing cable trays if available or fastened to floor stanchions. Cable from the building egress to the satellite earth station equipment will be installed in protective conduits.

The system interconnection between the Consoles, printers, and ancillary equipment to the Equipment Area Racks is by twisted pair Ethernet cables. These category 5, plenum rated cables will be tied to the raised floor stations to keep them off of the subfloor.

3.3 Maintenance Access Requirements

3.3.1 Equipment Area Maintenance Access Requirements

The OASIS Equipment Area racks are readily accessible at the front or through the enclosure doors at the rear. Harris recommends 36" service clearance directly in front of and behind the equipment for service access. The rear doors are hinged to swing through 90° to allow maintenance access to the equipment. In addition, the doors may be removed by lifting them off the hinge points.

3.3.2 Specialist Console Maintenance Access Requirements

Harris recommends 36" clearance in front and rear of the Specialist Consoles for Specialist and maintenance access. All maintenance access to the specialist console will be either from the front or the rear of the Consoles. The workstations located in the lower right side of the console bay is set on a panel that Harris provides. Consoles are accessed from the front and rear by the slide latches in the upper portion of the console doors. These latches slide down and the door assembly can be completely removed.

4.0 EQUIPMENT LOCATION

4.1 Equipment Area

Figure 4.1 shows the Equipment Area floor plan for FAA Aeronautical Center (FAAAC). The OASIS equipment is hatched for ready identification from the other equipment located within the area.

These floor plans will be used for all system interconnection measurements. If any equipment placement changes, the FAA must notify Harris so that the appropriate cable lengths can be delivered during installation. Minor changes can be accommodated during installation.

4.2 Floor Plans

Figure 4.2 illustrates the FAA Aeronautical Center (FAAAC) Specialist Position floor plan. The OASIS equipment is hatched for ready identification from the other equipment located within the area. All of the OASIS equipment will be installed with no cutover transition sequence.

4.3 Satellite Earth Station

Harris will install the satellite earth station reflector on a non-penetrating roof mount pedestal. The pedestal will be located toward the south end of the Flight Inspection building roof above a support column with the ballast centered directly over the support beams. The roof membrane will be protected by rubber matting between the ballast pans and the membrane. Pavers will be installed as a walkway from roof egress door to antenna location. Pavers will be used around the perimeter of the antenna location. This mounting configuration and associated ballast is designed to survive 125MPH wind load.

Figure 4.3-1 shows the location of the new satellite earth station and Figure 4.3-2 documents the look angle obstructions.

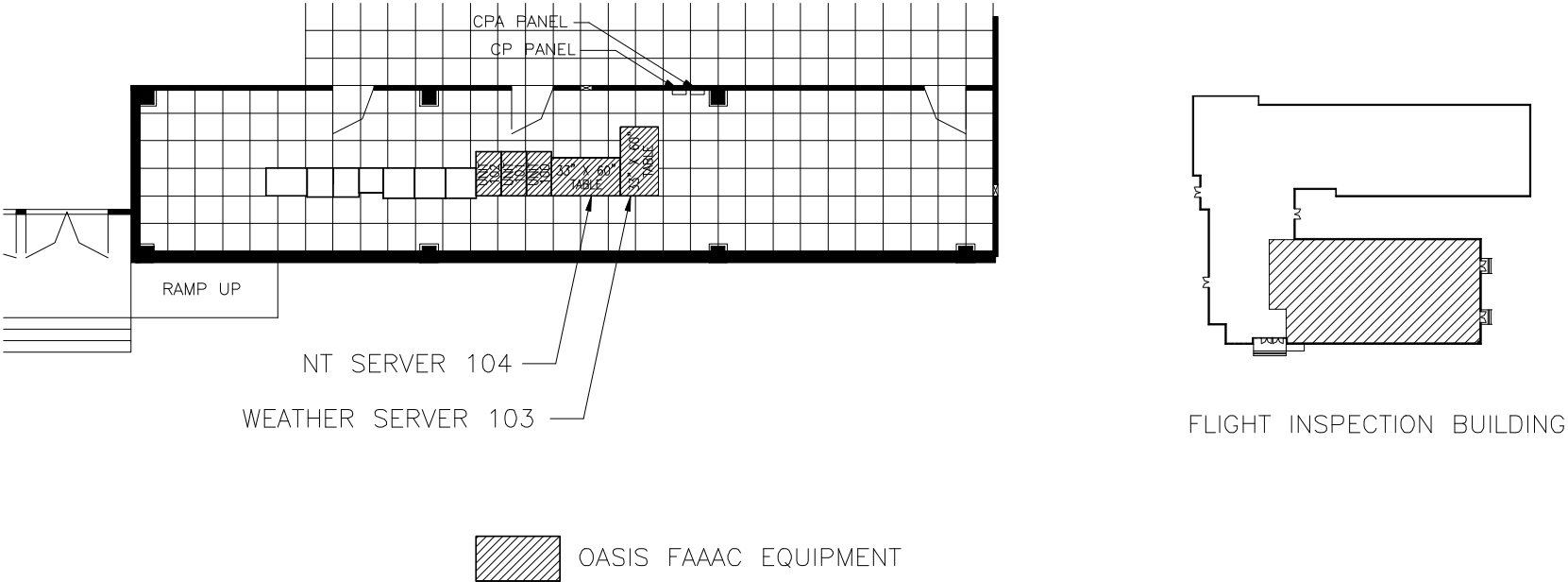


Figure 4.1 OASIS FAAAC Equipment Area Floor Plan

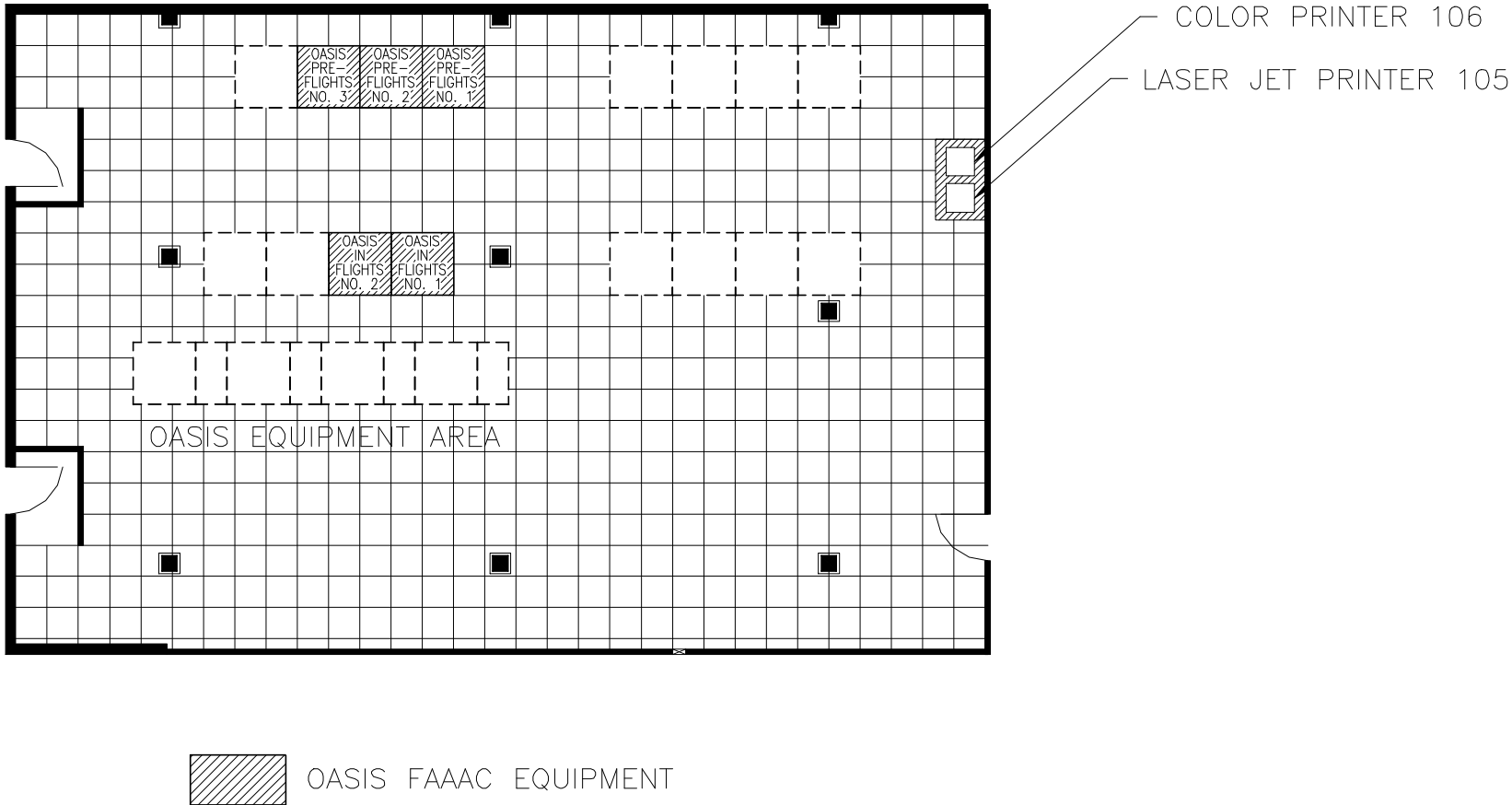


Figure 4.2 FAAAC Specialist Position Floor Plan

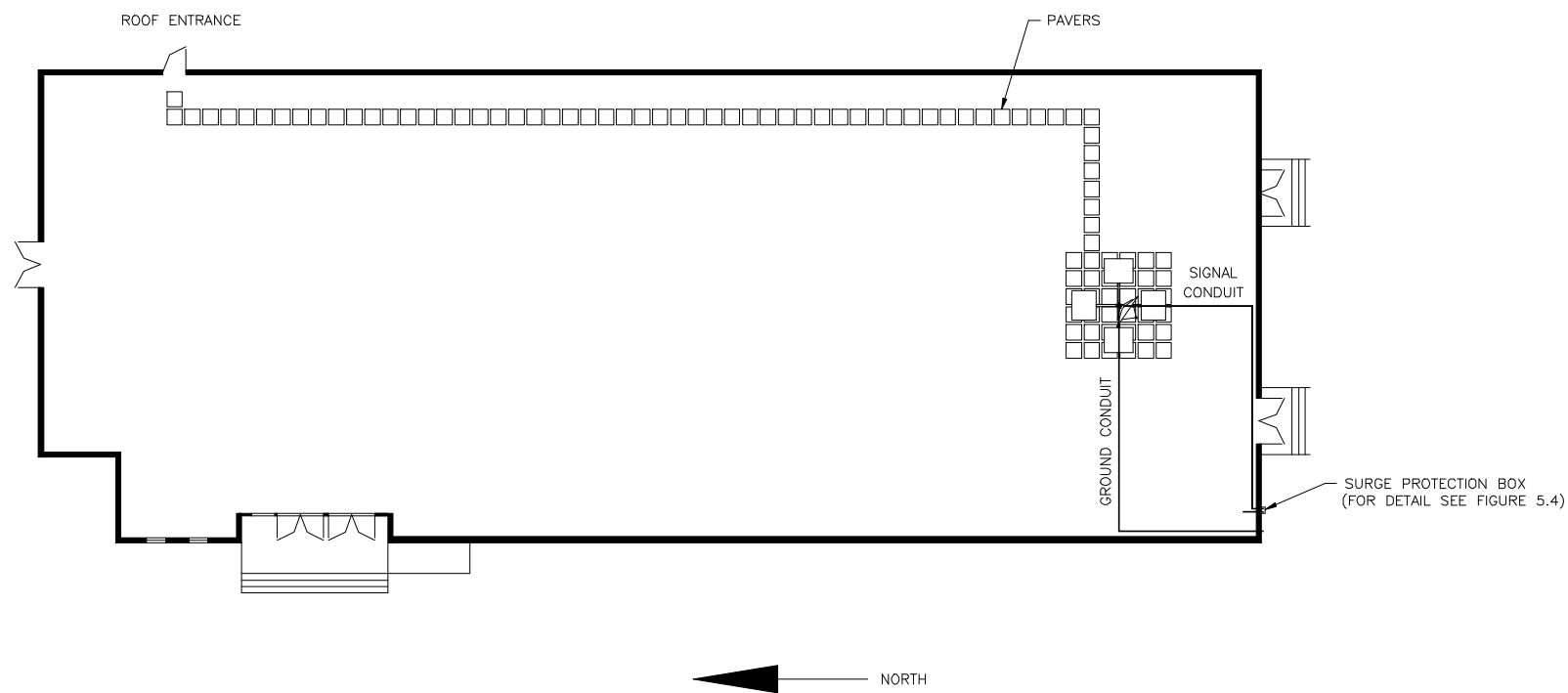


Figure 4.3-1 Satellite Earth Station Location

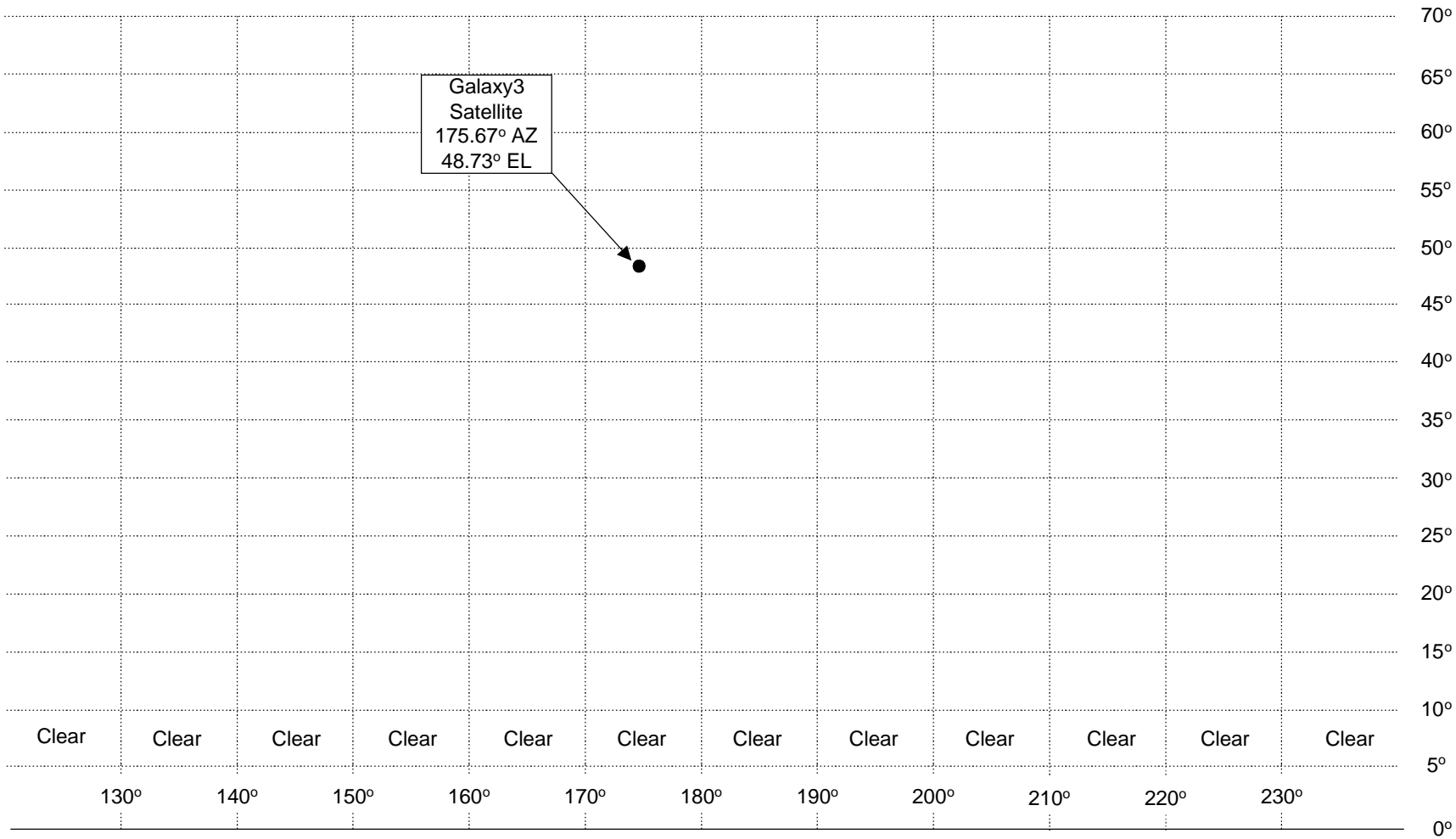


Figure 4.3-2 Satellite Look Angle Obstructions

5.0 SYSTEM INTERCONNECTION

5.1 Cable Routing

Figure 5.1-1 illustrates the cable routing Harris will use for the OASIS FAA Aeronautical Center (FAAAC) installation. Figure 5.1-2 illustrated the cable routing Harris will use for the NADIN II and Telco installation.

5.2 Equipment Area

The interconnecting cables between the System A Unit 100, Common Equipment Unit 101, and System B Unit 102, racks will be installed inside the racks and will not be run underfloor. These cables will be dressed in during the installation time frame.

The cable to the Weather Server, NT Server, UNISYS Gateway, TELCO DEMARC, and NADIN Interface will be tied to the raised floor stations using nylon tie-wraps. No cables will be installed directly on the Equipment Area subfloor.

5.2.1 Site Interfaces

Harris will connect the OASIS equipment to site communications interfaces installed by FAA Aeronautical Center (FAAAC) personnel and which will be located within the area of the OASIS equipment cabinets Table 5.2.1 lists the Site communications interfaces. The installed FAA Aeronautical Center (FAAAC) interfaces shall be DB-25 Female connection RS-530 interface for the NADIN II line and RJ-11 dial-up Telco line interfaces female receptacles for the Remote Access Dial up lines quantity four (4) each, Weather backup line quantity one (1) each and the Help desk quantity (2) each.

Table 5.2.1 Site Communications Interfaces

Description	Quantity	Need Date	Connects to	Comments
NADIN II Dedicated Lines	1	Feb 99	NT Servers	Via LINCS Switch
Remote Access Dial up Lines	4	Feb 99	Remote Access Servers	Normal dial-up Telco lines
Weather back-up Line	1	Feb 99	Remote Access Servers	Normal dial-up Telco lines
Help Desk Lines	2	Feb 99	Remote Access Servers	Normal dial-up Telco lines

5.3 Operations Area

Interconnections between the Specialist workstation and the supporting equipment are completed within the console. Harris will dress the support equipment cables using nylon tie-wraps to the console structure as part of the installation.

The UTP cabling that interconnects the Common equipment rack to the Specialist consoles, and printers will be tied to the under floor stations using nylon tie-wraps.

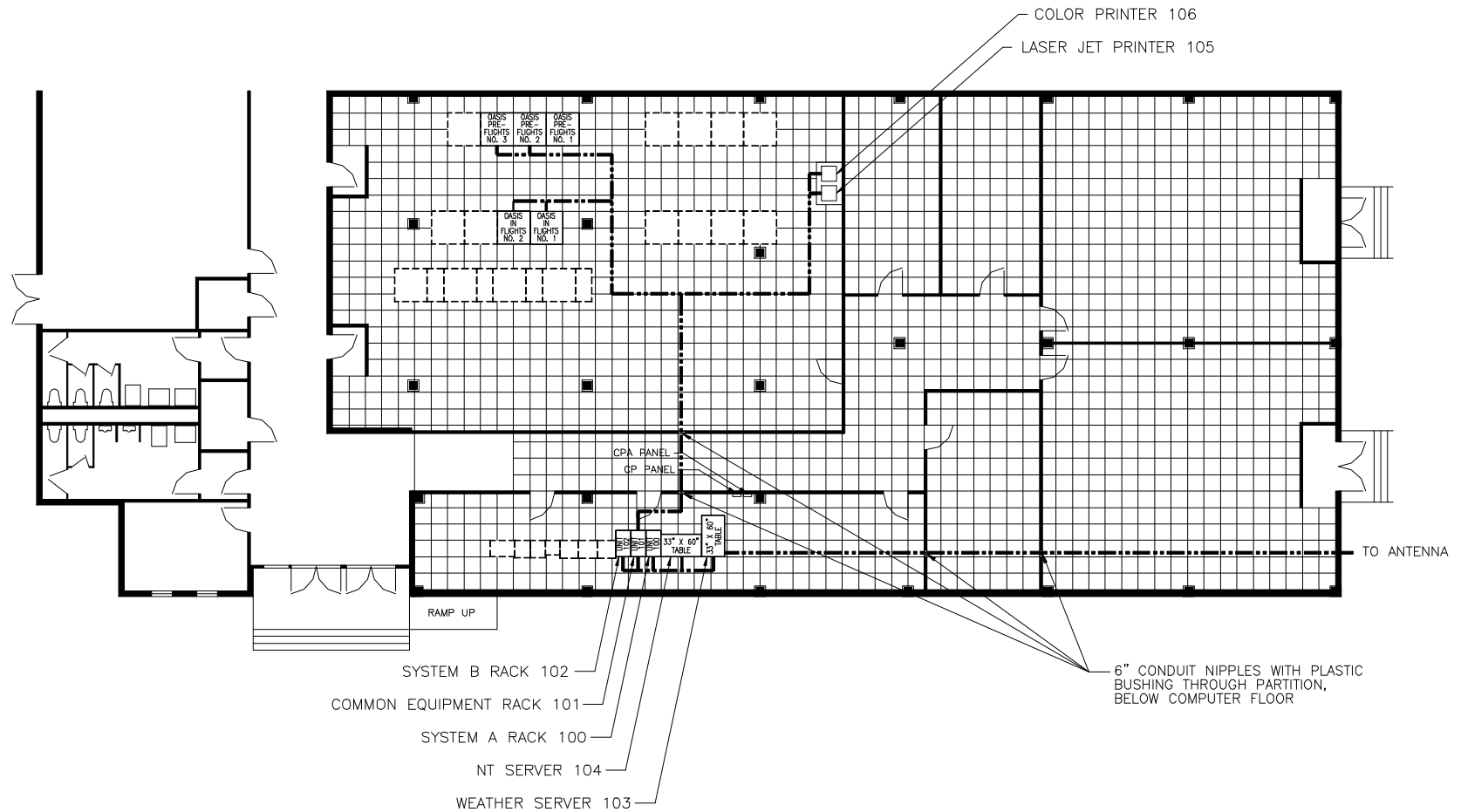


Figure 5.1-1 OASIS FAAAAC Cable Routing

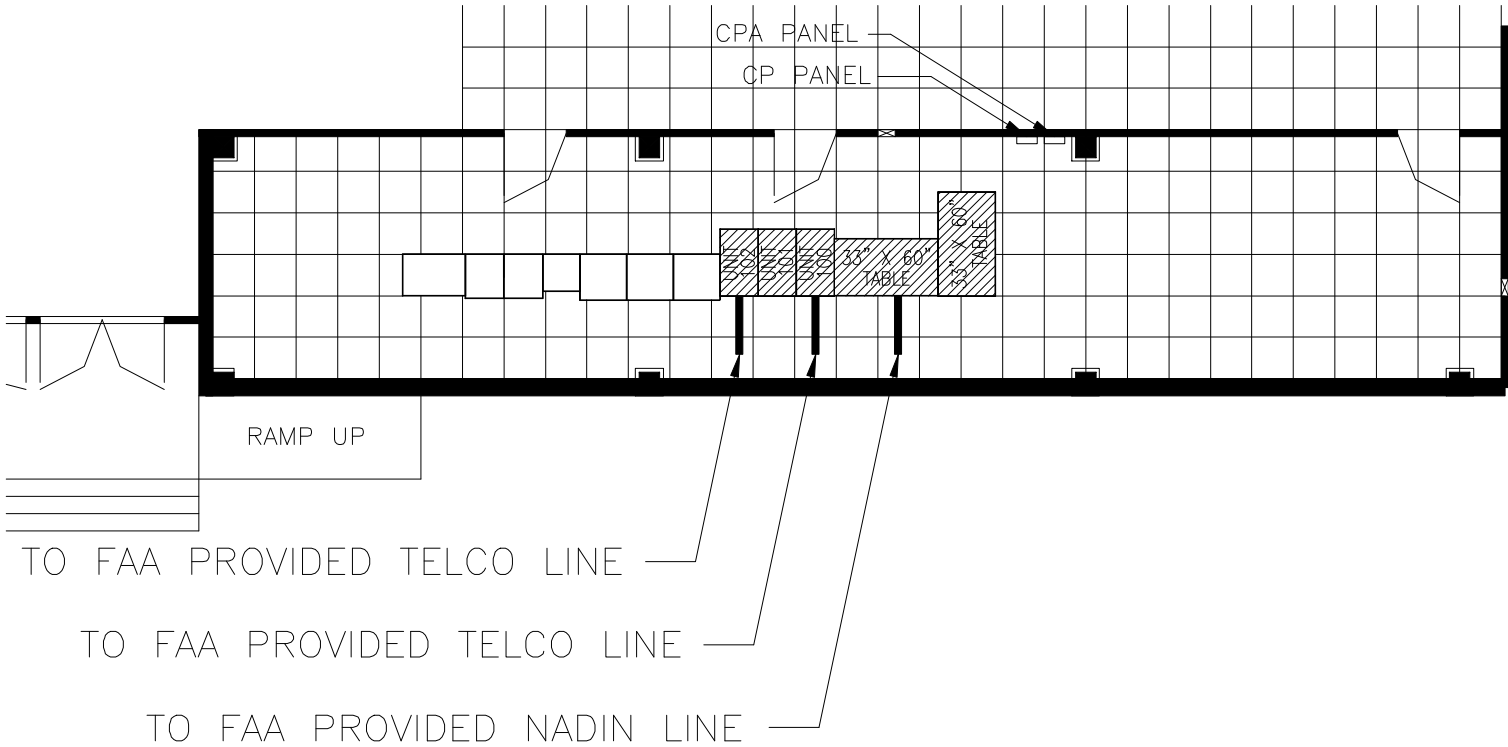


Figure 5.1-2 NADIN II and Telco Cable Routing

5.4 Satellite Earth Station

The Harris earth station contractor will install chemically welded, rigid galvanized conduit during the Site Preparation phase. This conduit will run from the earth station pedestal to the lightning protection and then the building egress. At the building egress, the Harris subcontractor will install the surge/lightning protection enclosure to the conduit that penetrates the building. The conduit and surge/lightning protection enclosure will be made environmentally tight. Inside the building, the cable will run from the ceiling between the concrete block and the dry wall to the under floor where the cable run will continue to the Equipment Area. Figure 5.4 illustrates the interior and exterior segment cable egress.

The satellite earth station requires one cable to be run from the Common Rack to the surge/lightning protector and then to the LNB. This cable carries both 24 volts DC and the converted L-band signal. The cable run is broken into the interior and exterior segments.

The interior segment egresses the building at the surge/lightning protector mounted to the building wall through conduit. Removable firestop will fill the conduit after the cable run is made.

The exterior segment starts at the surge/lightning protector and runs in roof mounted conduit to the rain hood located by the earth station antenna. The cable exits the rain hood and runs down to form a drip loop so that water and condensation runs away from the conduit.

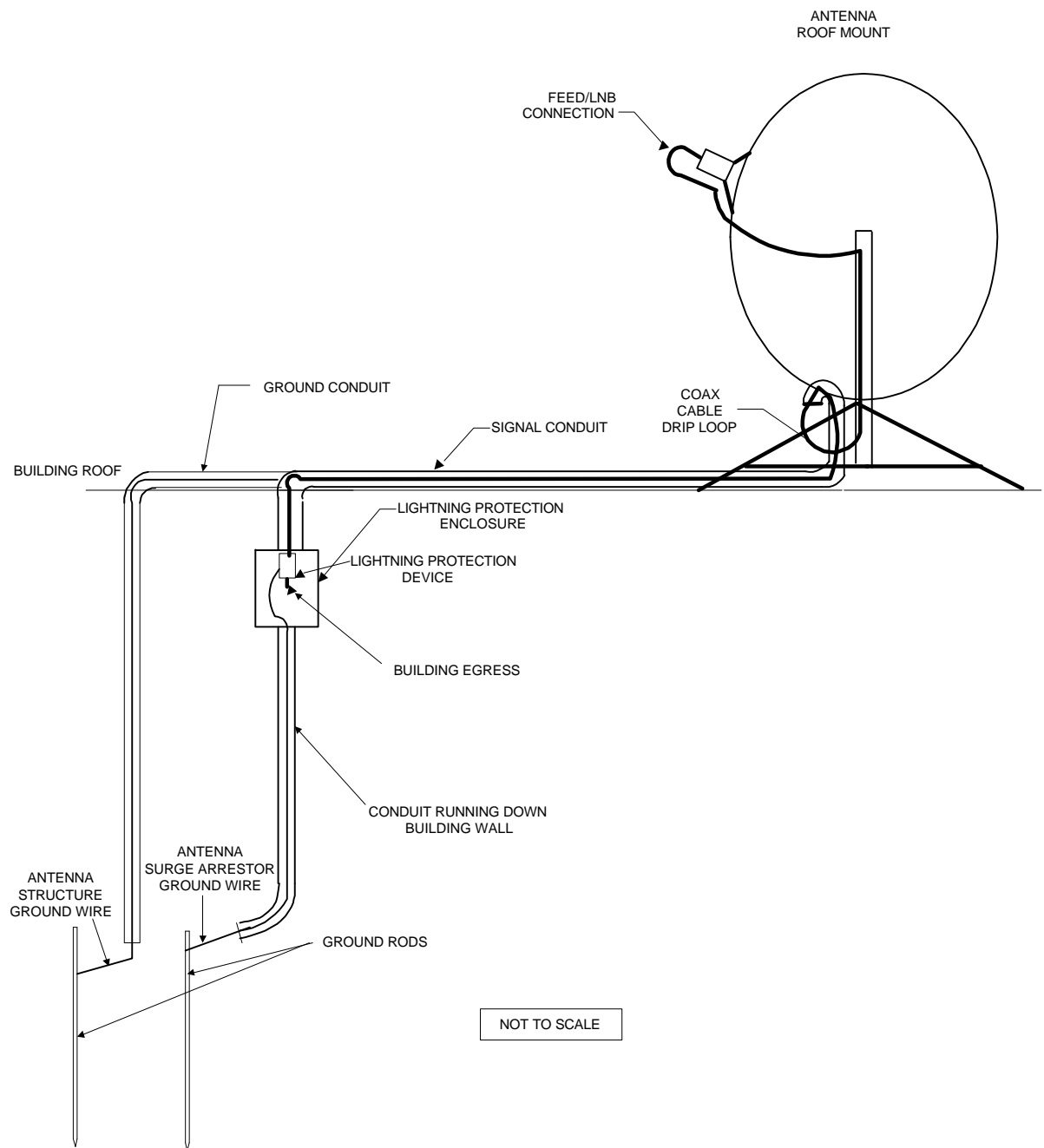


Figure 5.4 Exterior Satellite Earth Station Cable Routing

6.0 POWER AND GROUND

6.1 Input Power Characteristics

The OASIS will operate on commercial, UPS, or generator power with the following characteristics:

- a. Voltage (Nominal): 120 VAC, 1-phase, 3-wire (voltage, neutral, ground)
- b. Voltage Tolerance: $\pm 10\%$ of nominal
- c. Voltage Variation: $\pm 5\%$ of nominal max.
- d. Frequency (Nominal): 60 Hz
- e. Frequency Tolerance: $\pm 1\%$ of nominal
- f. Frequency Variation: $\pm 1\%$ of nominal, max.
- g. Maximum Transient Voltage: $\pm 30\%$ of nominal amplitude for periods less than 500 milliseconds.

6.1.1 Site Power Design

Harris electrical sub-contractor will use the Critical Power Panelboard CP located on the east wall of the equipment room 103 as the power source for the FAA Aeronautical Center (FAAAC) OASIS equipment cabinets. The Harris electrical sub-contractor will remove the three pole breaker in slots 38, 40, and 42 and will put into these slots three (3) single pole 30 Amp breakers. Harris Electrical sub-contractor will remove the wiring that is presently connected to the three pole breaker and pull the wiring out. Harris Electrical sub-contractor will install new wiring to the OASIS Equipment cabinets.

The Equipment Area power implementation is illustrated in Figure 6.1.1. The power, ground, and neutral wires will be derived from the power panelboard and routed under floor to the rear of the OASIS equipment racks and tables. The power will be terminated into 2 each, L5-30R twist-lock power receptacle connectors. All new wiring will be continuous from the power panelboard to receptacle connectors, with no wirenuts or any other splices used.

6.1.2 Satellite Earth Station Power Design

The satellite earth station power is derived from the satellite receiver. The receiver provides 24 Volts Direct Current (VDC) bias by injecting the voltage onto the center conductor of the coaxial cable. The bias current is stripped from the center conductor and used by the LNB. No further power is required at the earth station location.

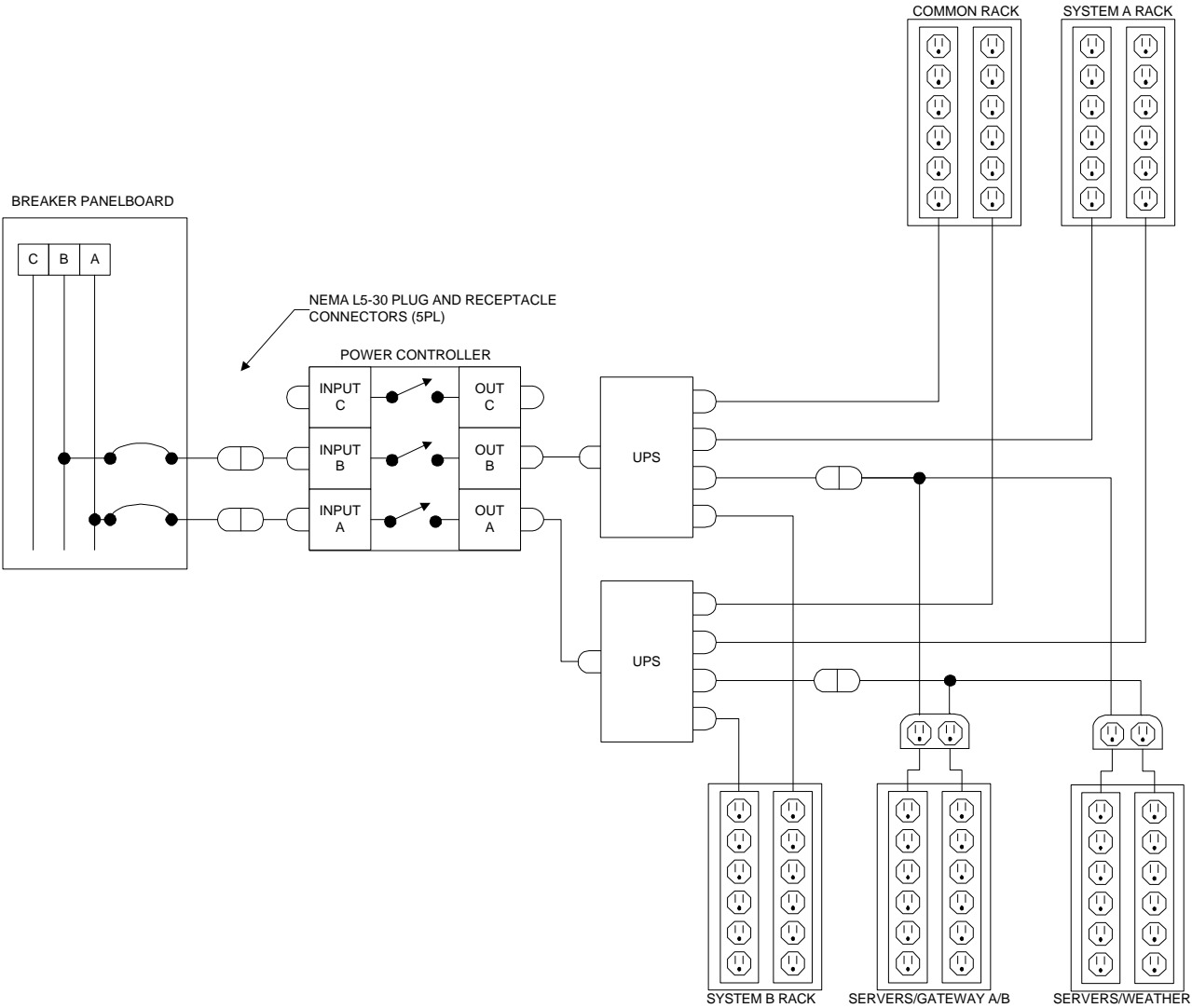


Figure 6.1.1 Equipment Area Power Implementation

6.2 Power Budget

Table 6.2 defines the OASIS power requirements for each cabinet and console in the FAA Aeronautical system and all peripheral equipment. A summary of the total system power is calculated at the bottom of the table.

Table 6.2 OASIS ACT Equipment Power Budget

Equipment	Quantity	PF	VA Ea.	Watts
Equipment Area				
UNISYS Receiver	1	.8	72	57.6
EF Data Modem	1	.8	72	57.6
Ethernet Switch	2	.8	317	507.2
Netserver	2	.8	60	96
Disk Array	1	.8	300	240
Flight Data Server	2	.93	998	1856.28
Weather Graphics Server	1	.8	480	384
NT Server	2	.8	480	768
Unisys Gateway	1	.8	372	297.6
DUAT Access Servers	0	.8	390	0.0
Equipment Area Sub Total				4264.28
UPS Inefficiency (15% worst case)				639.64
Equipment Area Total				4903.92
Operations Area				
LaserJet Printer	1	.8	396	316.8
Phaser Color Printer	1	.8	384	307.2
Workstations/Monitors	5	.8	428	1712
Operations Area Total				2336.00
System Total (Power)				7239.92

6.3 Ground and Bonding Implementation

6.3.1 Console Ground

The OASIS Specialist console workstations will use the ground supplied by the power panelboard. The ground will be connected to the workstation from the power cord plugged into the NEMA 5-15R receptacles located within the consoles. This ground is suitable for use in applications defined in National Electric Code (NEC) articles 250-45 and 645-15.

6.3.2 Equipment Area Ground

Each Equipment Area rack is supplied with an integral E1 ground stud (1/4-20) used to connect the rack frame to the Power Controller and the copper bus bar located in the rack bays. Individual equipment chassis grounds will be bonded at the copper bus bar using 10-32 hardware, where provisions have been made for ground connections. Vendor equipment that does not have a ground stud will use the power cord ground carried through the Power Controller to the power strip.

Figure 6.3.2-1 illustrates the grounding scheme that will be implemented within the Equipment Area racks, Figure 6.3.2-2 illustrates the rack to site grounding method for the FAA Aeronautical Center (FAAAC) system. Harris will use 2000 circular mil per lineal foot as a guideline for all ground connections. Connections to applicable vendor equipment is 12 AWG (6,500 circular mil) Teflon insulated wire for 3' 3" maximum length within the racks. The intent of this grounding scheme is to provide an equipotential low DC resistance multi-point ground, and not a low impedance high frequency single point ground.

Each ground terminal bond will be free of paint. All surfaces will be cleaned with isopropyl alcohol prior to assembly to degrease and remove any other loose impurities. The bond is then protected with antioxidant compound to prevent oxidation and enhance conductivity. The antioxidant compound contains an inorganic grease to fill the asperities in the two conducting surfaces, making the connection gas tight and protected from oxidation. The antioxidant compound also contains zinc dust for enhanced connection conductivity. All ground bonding hardware is torqued to form a 1500 PSI bond. This equates to 120 inch-pounds torque on the 1/4-20 frame stud, and 54 inch-pounds torque at the copper bus bar connections using 10-32 hardware.

Connection to the Site ground plate will use the same methods of wire sizing, cleaning, and torque. All ground bonds will be measured after the connection is made to ensure that there is less than 20mΩ connection resistance.

6.3.3 Satellite Earth Station Ground

Harris will install two ground wires for the exterior satellite earth station equipment and surge/lightning protection as illustrated in Figure 6.3.3. The earth station ground will be derived from ground rods driven into the ground at the south west corner of the Flight Inspection Building. The Coaxial lightning protection will derive ground from a ground rod driven into the ground at the location stated above.

In the event of an lightning strike, this grounding and protection method will direct 90% of the energy to the roof transpose ground. The remaining 10% of the strike energy will be directed to the building service entrance ground by the lightning protection device. The selected surge/lightning protection device is rated at 110 Joules and has multi-strike capability.

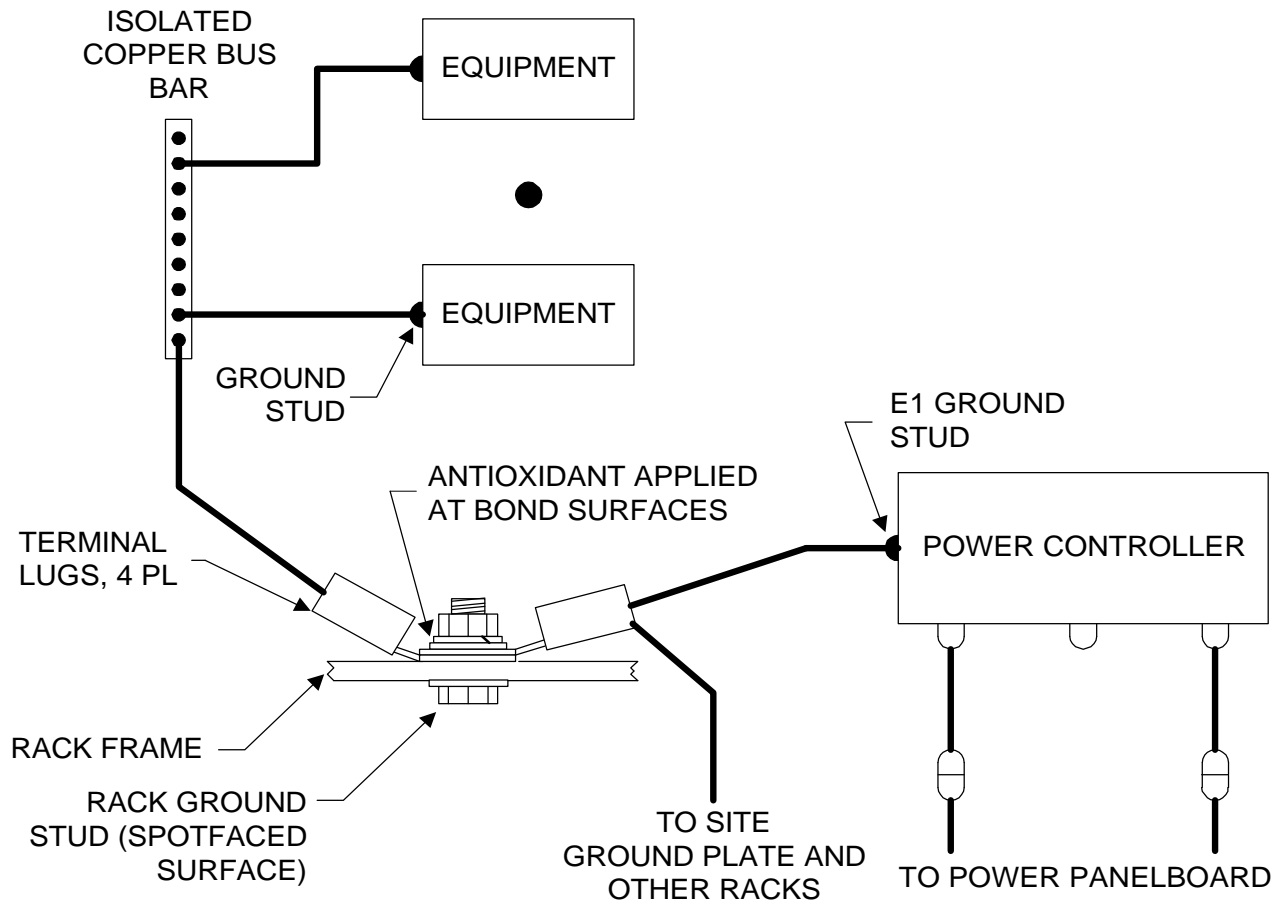


Figure 6.3.2-1 Equipment Area Rack Ground Implementation

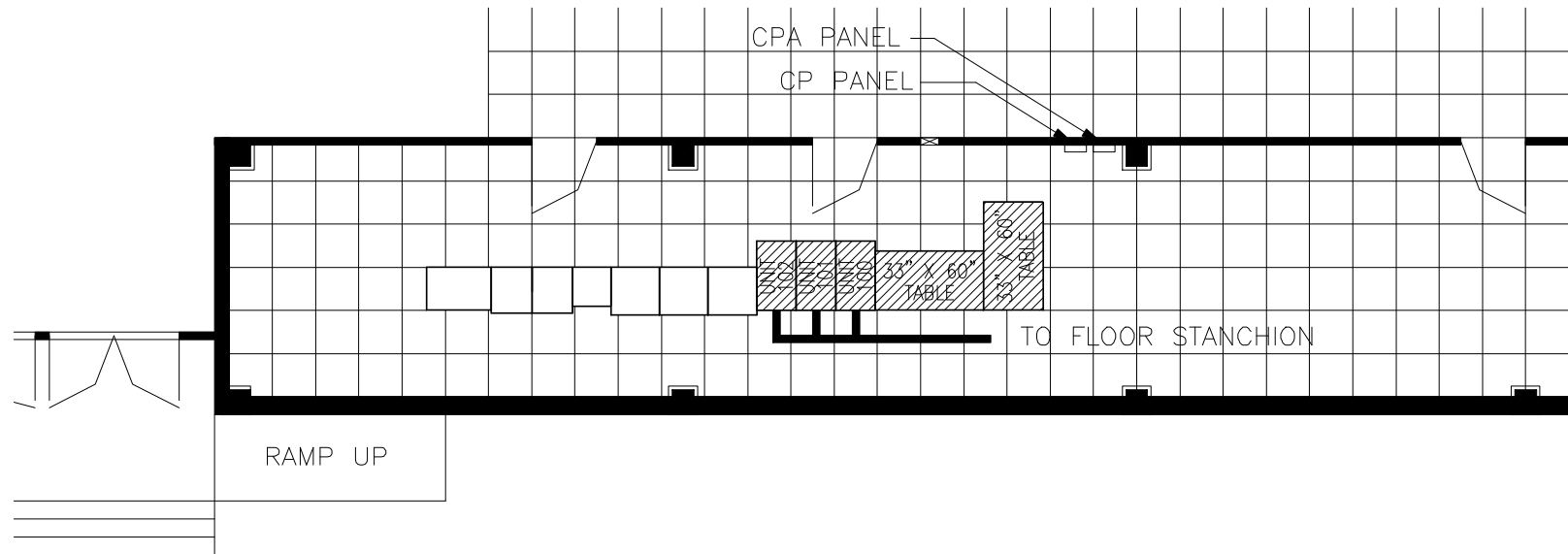


Figure 6.3.2-2 FAAAC Equipment Area Site Ground Connection

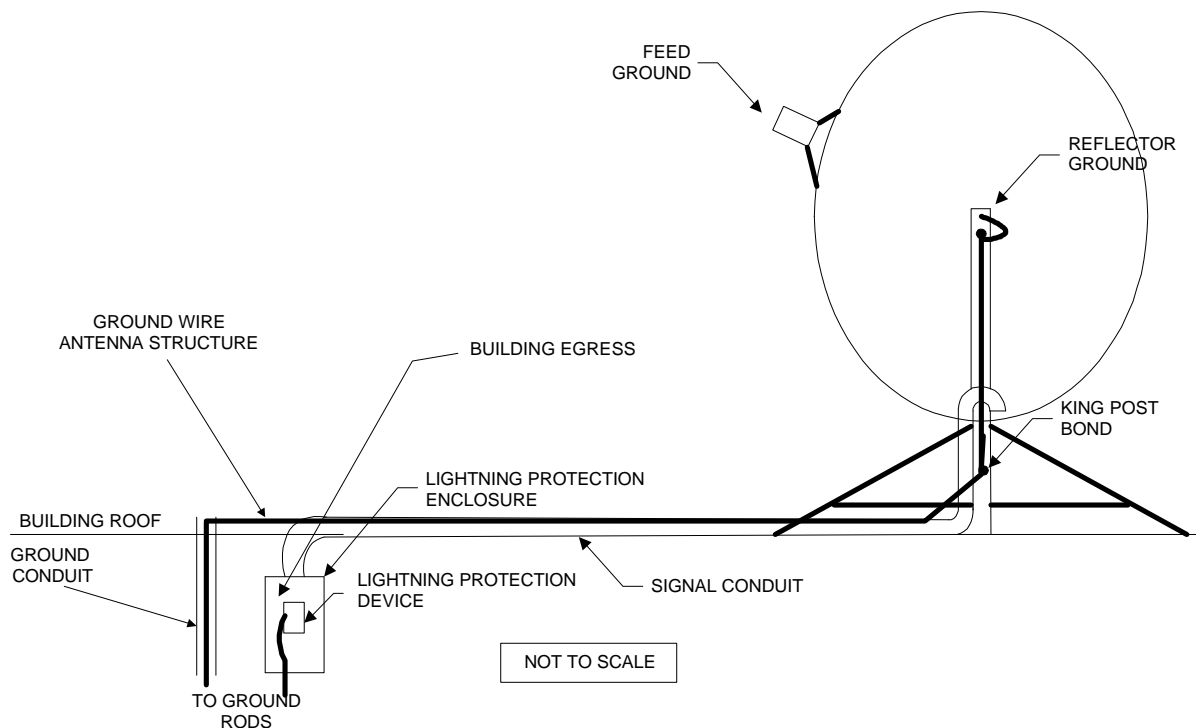


Figure 6.3.3 Satellite Earth Station Ground

6.4 Power Cabling

6.4.1 Power Cable Egress

All power cable interfaces to the OASIS Equipment Area racks are through the bottom of the Common rack (101) to the Power Controller Unit.

The power cabling to the Console equipment is maintained within the console from the power strip to the workstation and monitors.

6.4.2 Power Cable Configuration

The power cable termination for each OASIS element will be NEMA L5-30P twist-lock plugs. Harris will provide all Equipment Area receptacles, wiring, and conduit to the power panelboards. The color code defined in Table 6.4.2 will be used.

Table 6.4.2 Power Color Code

Function	Color
Voltage	Black/Red
Neutral	White
Ground	Green

7.0 EQUIPMENT COOLING AND HEAT LOAD

7.1 Operations Area

The Console cooling air is drawn by convection through the consoles from the bottom, rear, and front panel louvers. The air is exhausted through the top panels.

Table 7.1 and calculates the heat load OASIS will add to the ambient Operations Area environment for the FAA Aeronautical System (FAAAC).

Table 7.1 FAAAC Operations Area Heat Load

Equipment	Quantity	Watts	Total Watts/Hr	BTU/Hr
Operations Area				
LaserJet Printer	1	330	330	1125.993
Phaser Color Printer	1	320	320	1091.872
Workstations	5	200	1000	3412.1
Color Monitors	10	120	1200	4094.52
Operations Area Total			2850	9724.49

7.2 Equipment Area

Each of the Equipment Area racks has an internal 10" diameter fan that forces air from the rear air intake up through the rack. The fan is capable of moving 535 cubic feet per minute (CFM) of air. Table 7.2 calculates the Equipment Area heat load for the FAA Aeronautical Center (FAAAC) system.

Table 7.2 OASIS FAAAC Equipment Area Heat Load

Equipment	Quantity	Watts	Total Watts/Hr	BTU/Hr
Equipment Area				
UNISYS Receiver	1	60	60	204.726
EF Data Modem	1	60	60	204.726
Ethernet Switch	2	264	528	1801.59
UPS Inefficiency (From Table 6.2-1)		762	762	2600.02
Netserver	2	50	100	341.21
Disk Array	1	250	250	853.025
Flight Data Server	2	930	1860	6346.506
Weather Graphics Server	1	384	800	2729.68
NT Server	2	384	768	2620.49
Unisys Gateway	1	310	620	2115.502
DUAT Access Servers	0	325	0	0.0
Equipment Area Total			5808	19817.47

8.0 LIGHTING PLAN

The lighting requirements for the OASIS is within normal overhead lighting standards. Lighting is provided and maintained by the FAA.

9.0 ACOUSTICAL NOISE

9.1 Equipment Area

Data TBD

Figure 9.1 Equipment Area Acoustical Noise Calculation

9.2 Operation Area

Data TBD

Figure 9.2 Operations Area Acoustical Noise Calculations

10.0 TILE CUT-OUT AND EQUIPMENT TIE-DOWN

10.1 Tile Cut-outs

The As-Built engineering drawings detail the necessary floor tile cut-outs. These cutouts will be made prior to OASIS equipment installation during the Site Preparation phase. The cutouts will be verified during the Site Readiness Review Survey. The drawings provided to the FAA will detail the equipment “footprint,” as well as the air and cable cut-out holes. Harris is responsible for cutting all floor tiles and installing protective edging to prevent cable chafing.

10.1.1 Equipment Area Layout

All cabinets and consoles are positioned wherever possible to accommodate removal of the raised tiles directly behind them without moving the equipment. Refer to floor plan layouts in Figure 4.1-1 and 4.1-2 of this plan for equipment locations at the site.

10.2 Equipment Tie-down

The OASIS Equipment Area racks are retained to the concrete subfloor by threaded rods and unistrut. Harris will install the threaded rods, unistrut, and concrete anchors during the Site Preparation phase. The racks can accommodate this restraint with 3/8” holes in the rack bay corners. This tiedown meets the requirements of the Uniform Building Code (UBC) for seismically active areas. Figure 10.2 illustrates this tie-down method.

All rack and console mounted equipment is secured by MS51958 10-32 panhead stainless steel fasteners. The fasteners have a minimum tensile strength of 1600 pounds each. The workstations processors and monitors that are resting on the tables will have no restraint.

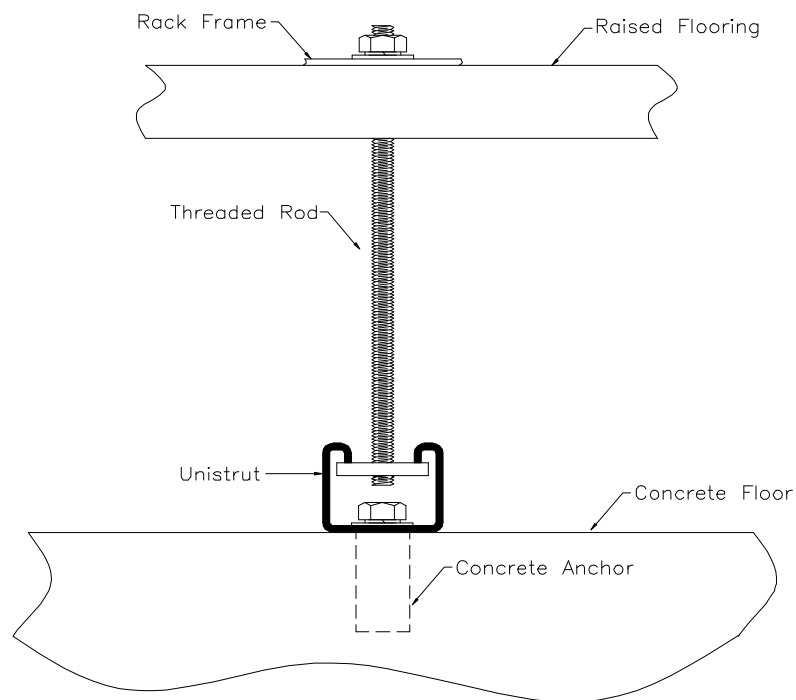


Figure 10.2 Equipment Area Rack Tie-Down

11.0 SITE READINESS REVIEW SURVEY

A Site Readiness Review Survey will be conducted by Harris and FAA Representatives within 20 working days prior to the date scheduled to begin the OASIS at the site. The purpose of these visits will be to ascertain the status of site preparations for receipt of the OASIS, and to reconfirm understandings of responsibilities for carrying out specific tasks.

12.0 SHIPPING AND STORAGE

12.1 Packaging

Prior to shipping, the OASIS equipment will be disassembled from the Test Lab configuration. All chassis that are not directly fastened to the equipment cabinets or exceed 30 pounds will be removed from the equipment cabinets and packed separately. All loose cable ends will be wrapped in plastic bubble wrap and secured to the inside of the equipment cabinets along with any other loose items.

The equipment cabinets will be wrapped in grade A paper and have cardboard edge and corner protectors in-place prior to being wrapped overall in polyethylene stretch film. All removed chassis will be placed in a waterproof barrier bag and inserted into a foam filled cardboard box.

All console modification equipment, sheet metal and hardware will be wrapped in paper and packed so items will not be subject to damage in shipment.

12.2 Marking for Shipment

The exterior of all shipping containers will be marked using normal commercial practices prior to shipment.

12.3 Method of Shipment

The system will be shipped via truck from Harris' facility to the site. Harris will coordinate the appropriate clearance and destination information and site location prior to shipment. Upon arrival at the site it will be Harris' responsibility to off-load, move equipment to final location and installation. Installation materials, tools, and spares will also be shipped with the system equipment.

Harris will be responsible for loss or damage to the equipment, tools, and spares after arrival at the site or storage facility.

12.4 Equipment Delivery

Harris will ship the FAA Aeronautical Center OASIS to the following Address:

Mike Monroney Aeronautical Center

Flight Inspection Building

6500 South MacArther Boulevard

Oklahoma City, Oklahoma 73169

Point of Contact: Hank Duncan , Phone 405-954-3106 or 405-954-6934

The equipment will be delivered to the West front door of the building as illustrated in Figure 12. The delivery time will be coordinated with the Site personnel.

12.5 Equipment Storage

Equipment will be moved directly from the truck and positioned in the area where equipment will be installed. There should be no requirement for off-site storage at the FAA Aeronautical Center (FAAAC).

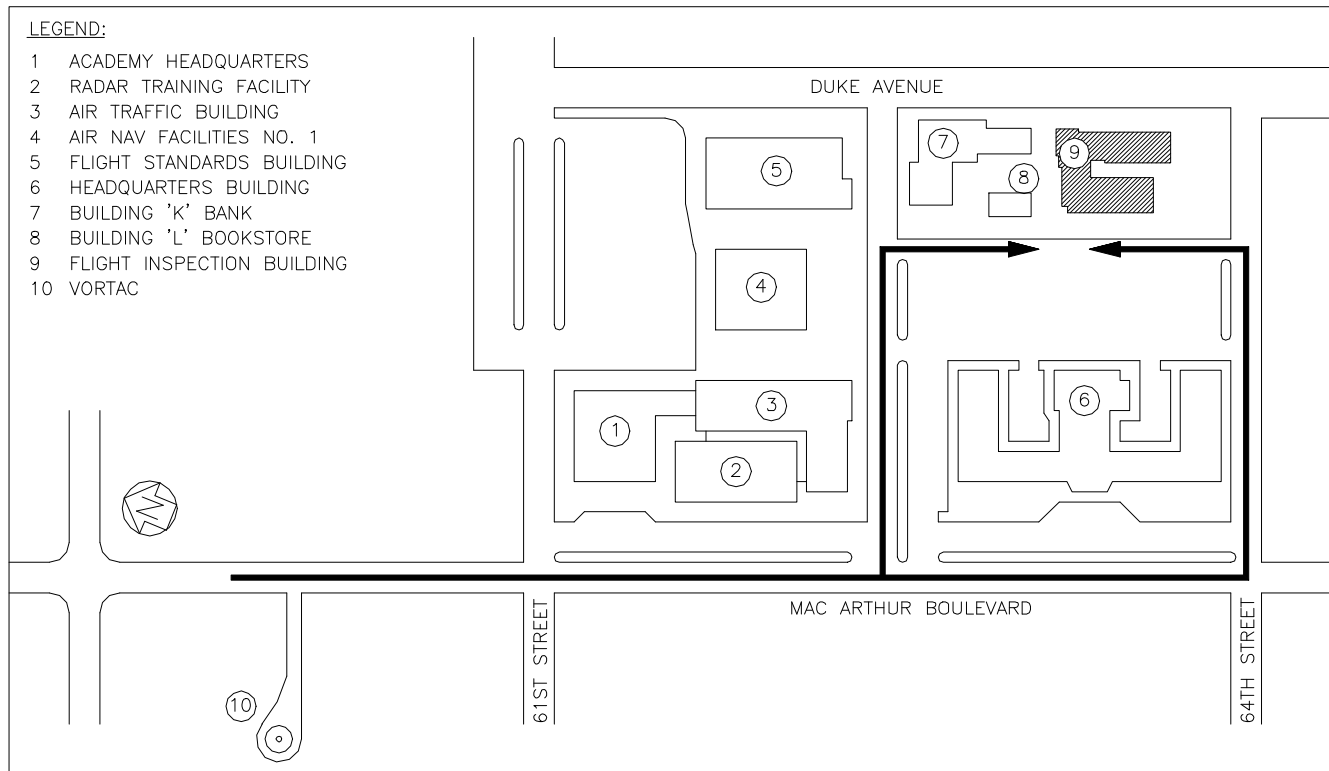


Figure 12.4 Equipment Delivery Route

13.0 INSTALLATION ACTIVITIES

13.1 Site Preparation

Prior to the OASIS Equipment arrival, Harris will have 2 subcontractors on-site during the Site Preparation phase to perform the electrical/facility modifications and the exterior earth station installation.

The electrical subcontractor will be responsible for installing the power in the Equipment Area, performing any Operations Area power modifications, making tile cut-outs, and anchoring the unistrut for seismic tiedown for the equipment racks.

The earth station subcontractor will install the king post pedestal, reflector, LNB, exterior conduits, roof pavers, ground wire, and lightning protection. After the installation, they will be responsible for finding the satellite and peaking the signal to optimum azimuth, elevation, and polarity. If the satellite ephemeris data indicates that the satellite is at the center-of-box, they will peak to that location.

13.1.1 Installation Overview

The following is a overview of events that will be performed during site installation:

- a. Harris will conduct a pre-installation briefing to introduce the installation team and inform the Site personnel of what to expect during installation and checkout. The briefing should take less than 2 hours and can be used as an opportunity for Site introductions and to start the coordination efforts with the Harris team.
- b. The Site is requested to conduct a brief tour of the facilities to familiarize the Harris installation team with the loading dock and installation areas. Any site unique or security procedures for access to any of the areas should be addressed at this time.
- c. Harris will unpack all of the equipment, tools, and installation material, and move the excess shipping containers and miscellaneous debris to dumpsters provided by Harris and positioned on the east side of the Flight Inspection building and within an area designated by FAA. The equipment will be inspected at this time for any damage during shipment.
- d. The Equipment Area equipment will be rolled into place, leveled, and anchored. All interconnecting cables will be connected at this time.
- e. Harris will install all of the under floor cabling prior to moving the equipment into place. The cable will be installed in existing cable trays. If the cable tray does not exist, the cable will be tied to the floor stations.
- f. The equipment will undergo power-up and initialization tests prior to the test team arrival. All site installed power will be verified before connection is made to the outlets. The initialization tests will consist of basic diagnostics and communications tests on the system to verify that the subsystem interconnections were performed properly.
- g. All of the console equipment will be installed.
- h. Site Acceptance Testing (SAT) will be conducted.
- i. The Harris installation team will clean-up any debris that was generated during the system installation.

13.2 Unpacking

Harris personnel will receive the OASIS shipment at the site loading ramp area. As the equipment is unpacked, it will be inspected for any damage prior to moving it to the installation area. A report will be written in the event of any lost or damaged installation materials, tools, spares, or equipment; and turned over to the cognizant FAA representative. Any site requirements for documenting property accountability will be addressed prior to moving equipment from the staging area to the installation location(s).

Detailed below is the receiving and unpacking sequence for the equipment:

- a. Harris will be responsible for ensuring that the unloading and staging area is clean prior to arrival of equipment.
- b. The equipment will be off-loaded from the truck by lift gate, unpacked, and inspected. Any damage will be noted on appropriate forms.
- c. Harris personnel will place the packing materials in a dumpster as needed.
- d. The equipment will be transported from the loading dock area to the staging and/or installation area.
- e. As the equipment is unpacked, it will be moved to the installation area. A storage area in the Flight Inspection building should not be necessary.

13.3 Console Installation Sequence

The Site console configurations are illustrated in Appendix B. Table 13.3 lists the sequence and console configuration. The console workstations will be configured as Preflight three (3) each and Inflight two (2) each.

13.4 Installation and Checkout

During the physical installation of OASIS at the site, various inspections and measurements will be made to ensure that the mechanical and electrical installation and interfaces are correct. The AC power input will be verified prior to turning power "ON" to the equipment. Equipment cooling will be verified and air flow adjustments made if required to meet cooling requirements. The equipment ground connections will be verified.

Module and system level testing, as specified in the site testing section of the OASIS Test Plan, will be conducted by Harris test personnel. Test results derived from this testing will be presented to the FAA Deployment Team Chief for approval and permission to proceed to the final test phase.

Table 13.3 Console Modification Sequence

Position Identifier	Location	Sequence	Appendix B Console Configuration
PF1	FAAAC	1	B-1
PF2	FAAAC	2	B-1
PF3	FAAAC	3	B-1
IF1	FAAAC	4	B-2
IF2	FAAAC	5	B-2

14.0 SPECIAL SITE REQUIREMENTS

14.1 Moving Devices

Harris will provide any moving devices that are required to move the equipment into place. All moving equipment used will have protective rubber wheels or casters to prevent marring or damage to the site floors.

14.2 Trash Removal

Harris personnel will deposit all packing materials and other debris in a dumpster provided by Harris and positioned in an area east of the Flight Inspection building and in an area designated by FAA site personnel. Harris will be responsible for the removal of the dumpster upon completion of the installation.

14.3 Other Facilities

14.4 Administrative Work Area

A work area to support administrative activities related to the installation and testing tasks at the site would be advantageous and is requested by Harris. Ideally this would be equipped with a desk and table, chairs, waste basket, and telephone.

15.0 TOOLS

Harris will provide the general hand tools that are needed to install the equipment. The tools will be shipped back to Harris after completion of the installation activities.

16.0 RESPONSIBILITIES OVERVIEW

Responsibilities for the efforts described in this plan are in accordance with the Statement of Work for the OASIS equipment procurements, system integration, and site installation.

16.1 Contractor responsibilities

The installation responsibilities that Harris assumes are listed in the following outline:

- a. Perform Site Surveys
- b. Prepare an Installation Plan.
- c. Perform Site preparation.
- d. Perform the Site Readiness review.
- e. Prepare the OASIS and related materials for shipment.
- f. Provide an Installation and Test Team for the deployment. Harris will provide a list of names and social security numbers for individuals that will be on site and the period of time.
- g. Unpack and inspect all items shipped to the site.
- h. Report any damaged items.
- i. Move the OASIS and associated equipment to the installation area from the staging (unpacking) area.
- j. Position and secure all equipment in accordance with site requirements; provide all necessary equipment isolation materials.
- k. Terminate and attach power and ground cables to systems equipment.
- l. Reinstall all chassis and other items removed for shipment.
- m. Connect all interconnecting cables.
- n. Perform system test in accordance with the OASIS Test Plan.
- o. Maintain the OASIS and document all maintenance actions in a log.
- p. Perform a Configuration Audit Review for the system.
- q. Deliver copies of test data sheets to the FAA.
- r. Inventory residual spares, tools, and installation hardware upon completion of installation activities for each deployment.

16.2 FAA Responsibilities

FAA responsibilities are listed in the following outline:

- a. Provide contact names of cognizant persons at site who may ascertain deliver routes and provide dock facilities for shipment to site.
- b. Provide security with a names of installation personnel from Harris or Harris Sub-contractors so temporary access to the facility can be obtained for the period scheduled for installation and test activities.

- c. Coordinate the OASIS Site Preparation Requirements and Equipment Installation Plan with all cognizant organizations to ensure compatibility with other site preparation and planning documents.
- d. Remove existing equipment or debris in the OASIS installation areas.
- e. Provide NADIN II communications interface prior to SRR (Feb 99).
- f. Provide Dial-up lines and numbers for the Netserver and clarify the interface prior to SRR (Feb 99).

17.0 PERSONNEL AND SCHEDULE

17.1 Personnel

Harris will furnish the appropriately qualified, certified, and cleared personnel to accomplish the tasks defined herein in accordance with the specified schedules.

17.2 Schedule

Figure 17.2 is a detailed schedule for the deployment and installation of the OASIS at the site.

Separate File

Figure 17.2 Deployment and Installation Schedule

APPENDIX A ACRONYMS

Acronym	Description
CFM	Cubic Foot per Minute
DC	Direct Current
DID	Data Item Description
DUAT	Direct Access User Terminal
EMT	Electrical Metallic Tubing
FMC	Flexible Metallic Conduit
FOC	Full Operating Capability
HWDS	Harris Weather Data System
ICBO	International Conference of Building Officials
LAN	Local Area Network
LNB	Low Noise Block (downconverter)
NEC	National Electric Code
NEMA	National Electrical Manufacturers' Association
NFPA	National Fire Prevention Association
NT	New Technology
PF	Power Factor
RF	Radio Frequency
SAT	Site Acceptance Test
SPRIP	Site Preparation Requirements and Installation Plan
SRR	Site Readiness Review
SRRS	Site Readiness Review Survey
TELCO	Telephone Company
OASIS	Operational and Supportability Implementation System
UBC	Uniform Building Code
UTP	Unshielded Twisted Pair
UV	Ultra-Violet
VA	Volt Amperes
VAC	Volts Alternating Current
VDC	Volts DC
VID	Vendor Item Description

APPENDIX B CONSOLES

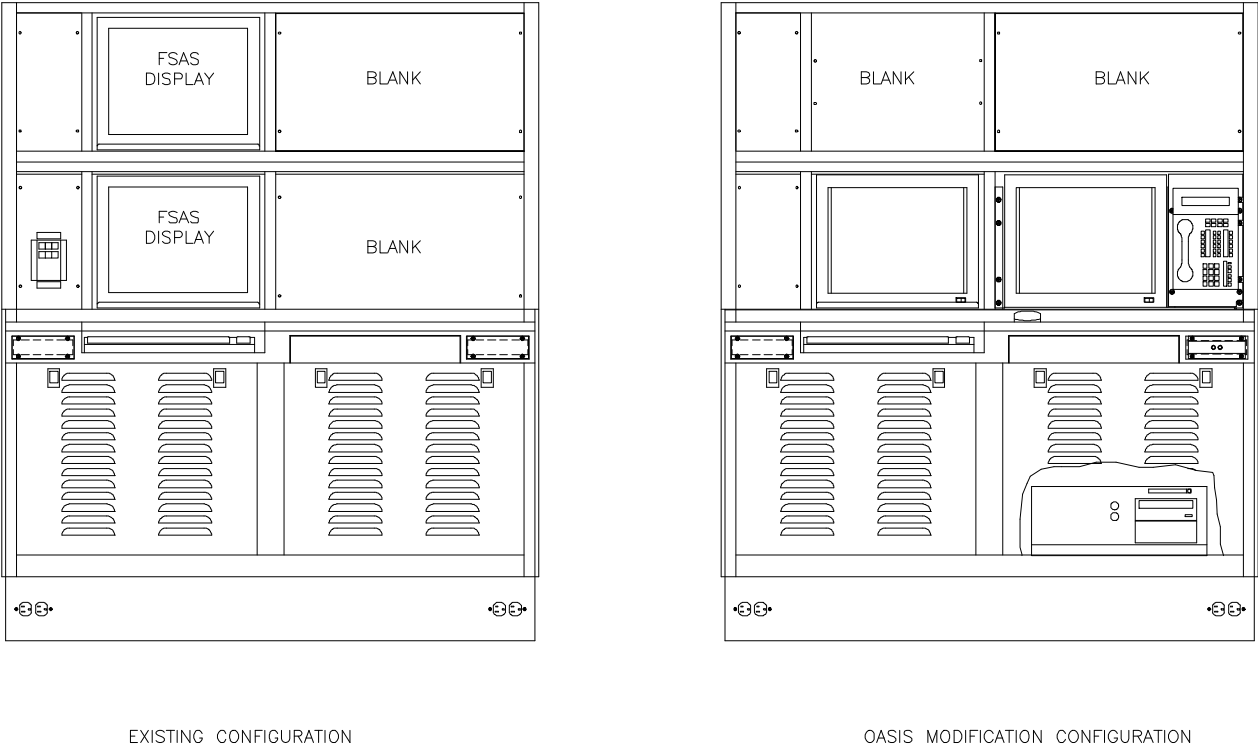


Figure B-1 Preflight Console

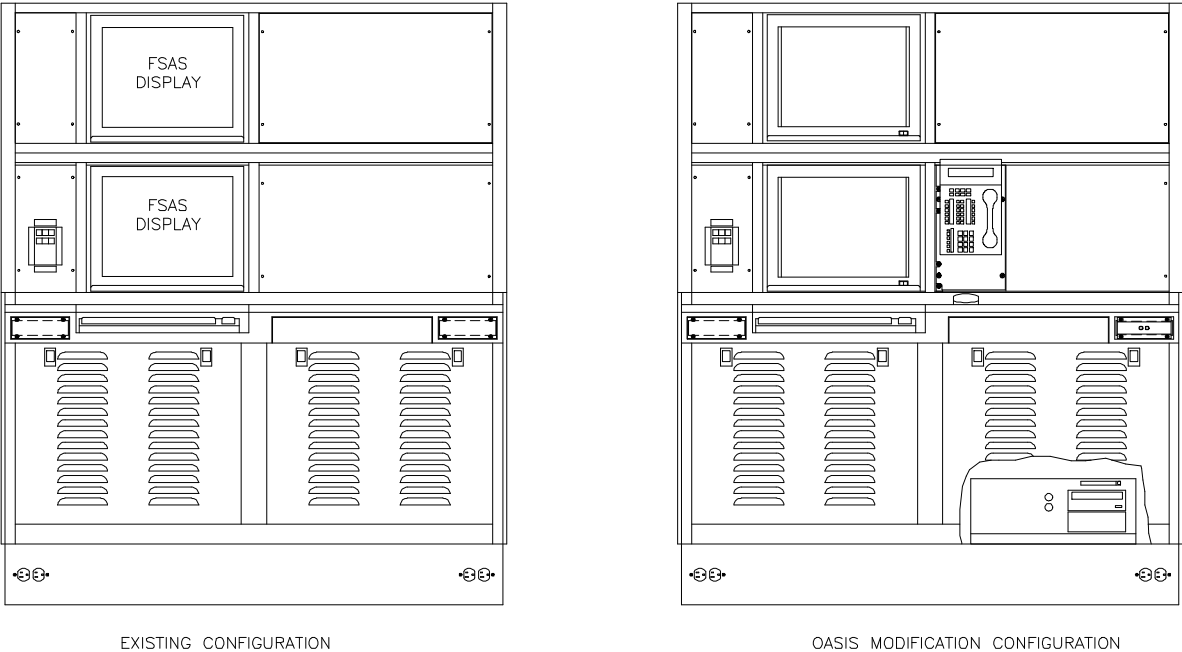


Figure B-2 Inflight Console